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A CONUNDRUM OF DECREASED IMPORT DEPENDENCE IN JAPAN

KIYOSHI KOJIMA

Abstract

It is a surprise that Japanese import dependence (import to GNP ratio) has declined by half to less than 6 percent in 1994 since early 1950's. This low import dependence symbolized the closedness of the Japanese market. The present paper attempts to explore the reasons of decreased import dependence. One reason was 'the principle of minimum intermediate goods import' which was enforced since the war time. According to structural changes in production and export, the imports of intermediate goods have changed their share from primary raw materials to processed materials and then to parts, components and other capital goods. This resulted in lower import dependence as a whole, since larger-import-content-industries have relatively declined, while smaller-import-content-industries have relatively expanded.

Other important characteristics of the Japanese import behavior are identified and analysed.

I. *Introduction*

Japanese import *dependence* (import to GDP ratio) has declined by half to less than 6 percent in 1993 and 1994 since the early 1950's. This is quite a surprise for us for two reasons. First, Japan, with limited natural resources, is widely thought to have a higher import dependence relative to other advanced industrial economies. Imports of intermediate goods are crucial factors for Japanese (and for other catching-up countries') economic development. The balance of payments deterioration becomes a 'bottleneck' for development, therefore, it is sometimes referred to as 'export or perish'. Actually, in the pre-war period (1909–1929), an average import dependence was at the normal rate of about 20 percent.[1]

Secondly, trade liberalization in Japan, which has progressed over the last 50 years, was expected to increase her import dependence as was observed in the United States, Germany and other advanced economies. This is because trade liberalization stimulates free competition in the market for foreign trade.

On the contrary, the import dependence actually declined to distinctly low levels in the post-war Japan. This is indeed a conundrum. This riddle triggered a lot of complaints and criticisms from abroad, especially from the United States, against the large Japanese export

[1] With regard to Japan's pre-war import dependence, see Kojima, Kiyoshi, 'Economic Development and Import Dependence in Japan,' *Hitotsubashi Journal of Economics*, Vol.1, No.1 (October 1960).

surplus and the closedness of the import market.[2] Therefore, it is an urgent task, as the present paper attempts, to explore the reasons for the decline in Japanese import dependence which is contrary to our expectation and to the advanced countries' experiences.

Another foreign complaints focused on the very low *share* of manufactured goods in total imports, which remained about 20–30 percent in 1952–1980 and increased to 55 percent in 1994, while the total import *dependence* has decreased even through the 1990's. Relatively low import share of manufactured goods was a reflection of Japanese import policies which tried to limit imports of intermediate goods not by the price mechanism but by the 'principle of minimum intermediate goods import.' The share of manufactured imports since 1980 has increased as mentioned above, however, which was due to an increase in imports of almost all intermediate goods.

Recently, the third complaint was added; Japan has received very limited inward foreign direct investment (FDI), while her outflow FDI stock is significant, e.g., 15.5 times the inward FDI in 1992.

Imports are determined, say in the United States, through the welfare maximization processes of national demand system. Such imports may be called 'imports in demand system.' On the other hand, in Japanese model, imports are utilized as complementary inputs for the national supply (or production) system. These imports are 'imports in supply system.' We call this Japanese model a 'processed export economy.' It is interesting that we are able to theoretically identify those two distinct systems in this paper, which are not well recognized in the conventional theory. The following observations can be better understood from the point of view of the 'imports in supply system.'

The post-war Japanese economy has experienced rapid structural changes in production and export; shifting leading industries from one period to the next. In period I (1952–1973), the leading industry measured in terms of its GNP share has shifted from labor-intensive light industries (textiles and sundries) for the post-war economic reconstruction to heavy and chemical industries (typically steel and basic chemicals). In period II (1974–1984), the Japanese economy was disturbed by the oil shocks (October 1973 and January 1979) and various technological advances were introduced to save energy and import of petroleum. In period III (1985–1994), several kinds of machinery (especially, electric and electronic machinery and automobiles) expanded their shares.

These structural changes in production were brought about by the changes in the composition of imports; the imports of intermediate goods have changed their share from primary raw materials to processed materials and then to parts, components and other capital goods. This resulted in lower import dependence as a whole, since larger-import-content-industries, such as textile industry, have relatively declined, while smaller-import-content-industries (relative to total value-added), such as steel and basic chemicals, have relatively expanded. Japan thus decreased her total import dependence. A similar decrease in import dependence was repeated in case of the structural upgrading from heavy and chemical to

[2] Just to mention a few: Lawrence, Robert Z., 'Imports in Japan: Closed Markets of Minds?', *Brookings Papers on Economic Activity*, 1987, 2, 517–54. Saxonhouse, Gary R., 'Japan's Intractable Trade Surpluses', *World Economy*, September 1986, pp.239–57. Saxonhouse, Gary R., 'What Does Japanese Trade Structure Tell Us About Japanese Trade Policy?', *Journal of Economic Perspectives*, Vol.7, No.4, Summer 1993, pp.21–43. Bergsten, C.F. and Noland, M., *Reconcilable Differences?: United States-Japan Economic Conflict*, Institute for International Economics, Washington, D.C., 1993.

machinery industry. This was entirely true if there were no import of consumer goods. Japan's 'minimum intermediate goods import principle' brought about a decreased import dependence in such processes.

As a result of the 'minimum intermediate goods import principle,' mainly vertical trade of exporting manuractures and, in exchange, importing primary commodities expanded in Japan, while Japanese horizontal (or intra-industry) trade of manufactures was limited. Such tendency was intensified by the government's industrial policies targeting a full set of manufacturing industries as briefly explained.

Now, the 'minimum intermediate goods import principle' should be rectified, since Japan has enjoyed the long-term trade surpluses. First, not only intermediate goods but also consumer manufactured goods should be imported so as to expand horizontal trade in manufactures. Second, imports should not be limited to technologically necessary amount, but should rather be subject to the price incentives of the market mechanism. Japanese imports determined by the market mechanism would increase significantly to about 20 percent of GDP[3] (which may be normal). Otherwise, the Japanese economy cannot grow further by benefiting optimal gains from trade.

In Section II, a detailed trend of import dependence in post-war Japan is discussed along with some international comparison.

Section III deals with structural changes in Japanese industry and export, and its relationship with the changes in import structures and import dependence.

In Section IV, the Japanese trade principle such as the 'minimum intermediate goods import' is briefly explained as a continuation of the war-time control regime.

Section V estimates Japanese import functions and confirms important characteristics that majority of imports consisted of intermediate goods that complement domestic production for technological reasons. As a result, only imports/GNP elasticity was significant and price consideration was largely neglected. The upgrading of the industrial structure brought about a decrease in import dependence mainly due to the technological reason.

Section VI recommends to increase Japanese import dependence up to a normal level (say 20 percent of GNP), by promoting horizontal trade both in manufactured intermediate goods and consumer manufactured goods. This is a crucial task for Japan because it not only mitigates foreign complaints but also enhances national production efficiency and welfare through unilateral liberalization of trade and foreign direct investment.

II. *Trend of Import Dependence in the Post-War Japan*

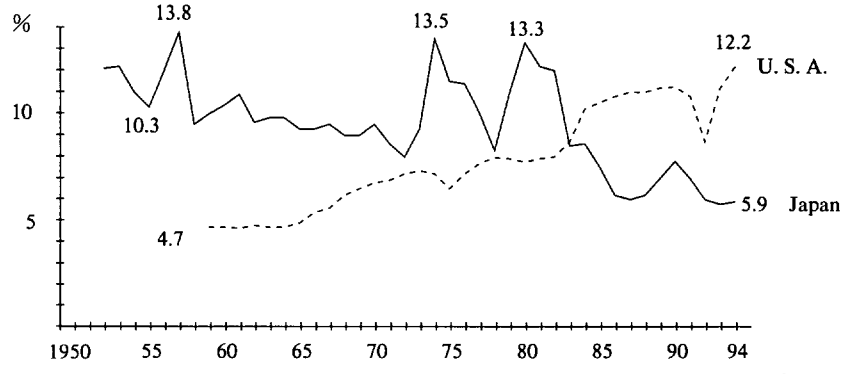
In Fig.1, Japanese *nominal* import dependence (i.e., current c.i.f. import value/current GNP) during 1952–1994 and that of USA (i.e., current f.o.b. import value/current GDP) during 1958–1994 are drawn. It is impressive that the two time-series data move in opposite directions to one another.

Japanese import dependence (shown by M/Y where M is the current import value and Y

[3] Following the equation in *World Development Report 1991* (pp.178–9, pp.194–5), we obtain the estimated trade (i.e., export+import) dependence to be 38 percent in 1988 and the import dependence to be 19 to 20 percent. See, Minami, Ryoshin, *The Economic Development of Japan* 2nd ed., Macmillan, 1994, pp.169–170.

FIG. 1. NOMINAL IMPORT DEPENDENCE

Japan, Import (c.i.f.)/GNP (current), 1952–1994.
USA, Import (f.o.b)/GDP (current), 1959–1994.



Source: Japan, Ministry of Finance, various years, *Zaisei Kinyu Tokei Geppo* (*Fiscal and Monetary Statistics Monthly*) in Japanese.
USA, *Economic Report of the President*, 1996, Appendix B Tables.

the nominal GNP or GDP) has decreased annually at the rate of 0.1 point[4] (See Table 1); it decreased from 12 percent in 1952 to 5.7 percent (which is the lowest) in 1993 or 5.9 percent in 1994.

Two points should be stressed:

(1) The decline in the Japanese import dependence has been a long-run trend, and
(2) the Japanese import dependence reached its lowest level of less than 6 percent in 1994.

In contrast, the time-series data of import dependence for the United States clearly indicates an upward trend of 21 percent increase annually; the coefficient for t is 0.211 (R^2= 0.9). It should be noted, however, that its calculation method differs somewhat from that of Japan. The US import dependence reached its high of 12.2 percent in 1994, which is more than twice the level of Japanese import dependence.

It is widely believed that the US is a large country with abundant natural resources, therefore, its import dependence is small. In addition to this perception, strong protectionistic trade policies in the 1930's kept the US import dependence at very low levels of 3 to 5 percent in the pre-war years. However, the US import dependence increased tremendously in the post-war period due to trade liberalization through consecutive GATT (General Agreement on Tariffs and Trade) negotiations and through multinational corporations' activities. The increase in the US import dependence provided Japan and other developing countries in Asia with a huge market. The US was a big absorber of foreign products and benefited significantly those newly industrializing countries.

Let us draw another interesting comparison in Fig.2A and 2B. Since oil is one of the most important imports in Japan, the two oil shocks created serious disturbances to the economy. Non-oil (nominal) import dependence in Japan is calculated and shown in Fig.2A. The time-series data shows that the import dependence has decreased by 10 percent annually with

[4] The estimated time series equation is $M/Y = -0.097\,t + 11.86$, $R^2 = 0.32$, where t denotes time (year).

TABLE 1. TREND IN TIME SERIES OF IMPORTS

(A) Entire period $t=1952-1994$		
Nominal import dependence (M=current imports, Y=current GNP)	$\frac{M}{Y} = -0.096738t + 11.85614$	$R^2=0.324034$
Real import dependence ($m=M/P_m$, $y=Y/P_d$)	$\frac{m}{y} = 0.111446t + 8.03887$	$R^2=0.587750$
Relative import/domestic prices	$\frac{P_m}{P_d} = -2.162594t + 145.36079$	$R^2=0.610363$
(B) Period I $t=1952-1973$		
Nominal import dependence	$\frac{M}{Y} = -0.168435t + 12.12337$	$R^2=0.614146$
Real import dependence	$\frac{m}{y} = 0.277018t + 6.37792$	$R^2=0.898952$
Relative import/domestic prices	$\frac{P_m}{P_d} = -5.267476t + 173.26233$	$R^2=0.923050$
(C) period II $t=1974-1984$		
Nominal import dependence	$\frac{M}{Y} = -0.071818t + 13.41090$	$R^2=0.026940$
Real import dependence	$\frac{m}{y} = -0.18545\ t + 16.28363$	$R^2=0.502487$
Relative import/domestic prices	$\frac{P_m}{P_d} = 1.218181t + 68.94545$	$R^2=0.089233$
(D) period III $t=1985-1994$		
Nominal import dependence	$\frac{M}{Y} = -0.219393t + 15.32666$	$R^2=0.310333$
Real import dependence	$\frac{m}{y} = 0.384848t - 2.94666$	$R^2=0.818908$
Relative import/domestic prices	$\frac{P_m}{P_d} = -3.992727t + 212.92000$	$R^2=0.593879$

smaller irregularity.[5]

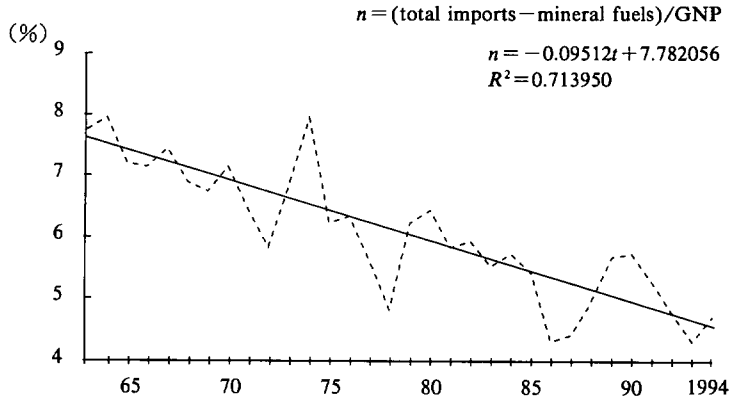
In contrast, non-oil import dependence in Germany (Fig.2B), which is drawn from Dornbush,[6] clearly increased from 12 percent in 1958 to 21 percent in 1990. The increase was due to German global trade liberalization through GATT and regional integration within the European Union.

Thus, the decreasing trend of post-war Japanese import dependence is distinctive and contrary to the progress of trade liberalization which has also been rapidly undertaken in Japan. Moreover, Japan's low import dependence which is less than 6 percent seems to be abnormal, hence it invites foreign complaints about the market closedness of Japan. Perhaps, about 20 percent would be the normal level of import dependence.

[5] The coefficient for t is -0.1 and R^2 is 0.71.

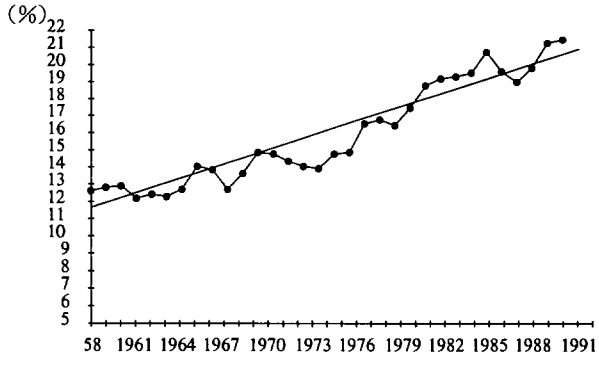
[6] Dornbush, R.W., 'The Case for Bilateralism,' in Dominick Salvatore, ed., *Protectionism and World Welfare*, Cambridge University Press, 1993, p.196.

FIG. 2A. NON-OIL IMPORT DEPENDENCE IN JAPAN



Source: Ministry of Finance, various years, *Zaisei Kinyu Tokei Geppo* (*Fiscal and Monetary Statistics, Monthly*) in Japanese.

FIG. 2B. NON-OIL IMPORT DEPENDENCE IN GERMANY



Source: R. W. Dornbush, "The Case for Bilateralism," in Dominick Salvatore, ed., *Protectionism and World Welfare*, Cambridge University Press, 1993, p.196.

III. *Structural Changes in Industry, Exports and Imports*

Changes in the structure of exports, which are shown by the relative shifts of the share of the ith good's exports (where $i=1, 2, \ldots, n$ goods) in total exports, reflect well the diversification and upgrading of the industrial structure for a new industry created domestically. The newly created industry attains competitive advantage and soon begins to expand its exports. In this way, the Japanese economy developed through export-led growth from one industry to another.

Exports

Table 2 shows the structure of Japanese exports for 1952–1994, which is divided into three

TABLE 2. STRUCTURAL CHANGES IN EXPORTS: *Share* OF EACH COMMODITY IN TOTAL EXPORTS (%)

A-Series

Calender year	Primary product		Machinery	Textiles				Manufactures total	Nominal export dependence
1952	4.5		9.8	35.3				91.8	7.6
1958	4.5		23.8	30.5				93.2	9.0
1964	3.2		32.2	19.8				95.5	8.3

B-Series

Calender year	(1) Food	(2) Industrial supplies	(3) Capital equipment	(4) Textile products	(5) Domestic electric equipment	(6) Passenger cars	(7) Consumer manufactures	(8) Manufactures total (3)+(7)	(9) Nominal export dependence
1964	4.8	45.0	25.7	5.3	4.5	1.2	22.9	48.6	8.3
1973	2.3	34.2	37.0	1.3	5.6	7.2	24.8	61.8	8.9
1974	1.5	41.4	35.1	0.8	4.3	6.3	20.0	55.1	12.1
1984	0.9	21.7	46.8	0.6	3.8	12.9	29.4	76.2	13.4
1985	0.8	20.4	46.5	0.5	4.1	14.5	31.1	77.6	13.0
1986	0.7	18.5	48.6	0.4	3.0	15.8	30.9	79.5	10.5
1987	0.7	18.2	51.1	0.4	2.4	15.6	28.7	79.8	9.5
1988	0.6	18.5	52.8	0.3	2.0	14.6	26.6	79.4	9.1
1989	0.6	18.2	54.3	0.3	1.8	14.1	25.2	79.5	9.5
1990	0.6	17.6	54.0	0.3	1.9	14.4	26.1	80.1	9.7
1991	0.5	17.4	54.6	0.2	2.0	14.2	25.6	80.2	9.3
1992	0.5	17.2	55.4	0.3	1.8	14.3	25.1	80.5	9.2
1993	0.5	17.0	57.6	0.2	1.6	13.0	23.0	80.6	8.5
1994	0.5	17.2	60.1	0.2	1.3	11.3	20.1	80.2	8.6

Source: Ippei Yamazawa and Yuzo Yamamoto, *Foreign Trade and Balance of Payments*, Estimates of Long-term Economic Statistics of Japan since 1968, No.14, Toyo Keizai Shinposha, 1979.
The Summary Report on Trade of Japan, Monthly, Japan Tariff Association.

periods as mentioned before. *A*-series presents more aggregated statistics prior to 1964, while *B*-series presents more disaggregated statistics after 1964. In *B*-series data, manufactures are sub-classified as follows: Food[7] which is categorized as intermediate goods in this paper;

[7] Food is also thought to be intermediate goods for human reproduction.

industrial supplies which consist of crude materials, mineral fuels (mainly oil), industrial chemicals, metals and textiles (raw); capital equipment which consists of non-electric machinery, electric machinery and transport equipment except for the following manufactured consumer goods; textile products (consumer non-durable goods), household equipment, domestic electric equipment, passenger cars, motorcycles and bicycles, and toys and musical instruments. There is some arbitrariness in this classification; for example, most machinery is classified as capital equipment while some machinery such as domestic electric equipment, passenger cars and motorcycles are classified as consumer durable goods. In this paper, food, industrial supplies and capital equipment are categorized as *intermediate* goods and the remainder as *consumer* goods.[8]

(1) The share of primary product in *A*-series and food in *B*-series has been low since the early 1950's. It has decreased to only 0.5 percent in 1994. In other words, the non-manufactured goods have been insignificant in post-war Japanese exports.

(2) The share of industrial supplies or processed materials (mainly steel products and basic chemicals) (see, series *B* in Table 2) was so large; the share was 45.0 percent in 1964. This reflects the fact that in Period I (1953–73), processed materials were the leading export items. But the share declined to 21.7 percent in 1984 and then to 17.2 percent in 1994. This means that new leading export items emerged in Period II (1974–1984) and Period III (1985–1994).

(3) Textiles in series *A* accounted for 35.3 percent in 1952 but declined to 19.8 percent in 1964. Textiles were the leading export item during the 1950's. As compared with this, textile products in series *B*, which separates textile raw materials from series-*A*'s textiles, accounted for 5.3 percent in 1964 which was larger than any other single export item of manufactured consumer goods. But, this manufactured textile products decreased their comparative advantage and export share to only 0.2 percent in 1994, and became one of the major import items, which will be examined later.

(4) Among the exports of other manufactured consumer goods, domestic electric equipment accounted for a large share of 4.5–3.8 percent in 1964–1984, and passenger cars occupied the largest share of 14.5–11.3 percent in 1985–1994.

(5) Thus, leading exports of manufactured consumer goods shifted in tandem from textile products to domestic electric equipment and then to passenger cars. The total export of manufactured consumer goods increased its share from 22.9 percent in 1964 to 31.1 percent (peak) in 1985, and declined to 20.1 percent in 1994.

(6) The most recent leading export item is 'capital equipment' which is the major intermediate goods today. The share of capital equipment increased from 25.7 percent in 1964 to 46.8 percent in 1984, and continued to increase up to 60.1 percent in 1994, while other export items tended to decline.

To sum up, Japan's exports grew fast by diversifying and upgrading its industrial structures, first from textiles to processed materials (steel), then to domestic electric equipment, to passenger cars, and lastly to capital equipment (various machinery). Such changes in industrial and export structures are sometimes referred to as the 'flying geese pattern of

[8] See, *The Summary Report on Trade of Japan, Monthly*, Japan Tariff Association.

development sequence.'[9]

Imports

Upgrading of industrial and export structures as explained above was implemented and promoted by the diversification of imported intermediate inputs. Two tables are created in order to show structural changes in imports: One summarizes the changes in the *share* of commodity i ($i=1, 2, \ldots, n$) in total imports (Table 3a), and the other summarizes the changes in the import *dependence* of each commodity (Table 3b). In other words, the share of commodity i in total imports is measured by $\frac{M_i}{\Sigma_i M_i}$ and the import dependence of commodity i is measured by $\frac{M_i}{GNP}$ or $\frac{M_i}{\Sigma_i M_i} \cdot \frac{\Sigma_i M_i}{GNP}$.

(1) The import share of intermediate goods in total imports (column (7) in Table 3a) was 97.8 percent in 1964, which decreased slightly to 92.9 percent in 1984 and declined to 79.8 percent in 1994. This reflects the fact that Japan insisted on limiting imports of intermediate goods to the minimum (that is the 'minimum intermediate goods import principle'), until very recently, say 1987–1990.

(2) The opposite aspect of the principle was the low import share of manufactured goods in total imports. That share had been less than 31 percent until 1984 and then it increased to 55.2 percent in 1994. But the import of manufactured goods included a lot of intermediate goods (i.e., processed materials and capital equipment). If intermediate goods were excluded, then the import share of consumer manufactured goods (textile products, domestic electric equipment, passenger cars, etc.) was merely 1.6 percent in 1964, which later increased to 4.3 percent in 1984 and reached 17.3 percent in 1994. In other words, the import of manufactured consumer goods was severely limited and the opening of markets for consumer goods took place quite recently which was after, say 1987, the US pressure became fierce.

(3) It should be noted that the increased import share of manufactured goods (both intermediate and consumer goods) did not change much the import *dependence* of manufactured goods (see Table 3b); 2.84 percent in 1964, 2.65 percent in 1984 and 3.26 percent in 1994. These unexpectedly small increases were brought about by a much larger decrease in total import dependence.

(4) The imports of intermediate goods experienced big changes in their composition as well as their dependence to GDP associated with the upgrading of the industrial and export structures (see Table 3a again).

(4a) Food in total imports decreased from 20.4 percent in 1964 to the lowest level of 13.0 percent in 1984, and turned to increase to 16.9 percent in 1994.

(4b) The import share of crude materials was so important that the share amounted to 35.4 percent in 1964, but by 1994, it has incessantly decreased to 9.3 percent.

(4c) The import share of oil (petroleum) abruptly increased to 30.4 percent in 1974 and 28.8 percent in 1984 due to the oil shocks, but decreased to 10.1 percent in 1994.

(4d) The import share of processed materials overtook the share of raw materials which had been relatively declining. The import share of processed materials increased from 19.6 percent in 1964 to 32.3 percent (peak) in 1988, and then decreased to 25.7 percent in

[9] See, Terutomo Ozawa, 'Professor Kojima's 'Trade Augmentation' Principle and the 'Flying-Geese' Paradigm of Tandem Growth', *Surugadai Economic Studies*, Special Issue in Honour of Professor Kiyoshi Kojima, Vol.5, No.2 (March, 1996).

TABLE 3a. STRUCTURAL CHANGES IN IMPORTS:
Share OF EACH COMMODITY IN TOTAL IMPORTS (%)

A-series

Calen-der year	(1) Crude food-stuff	(2) Crude mater-ials	(3) Coal & petro-leum			(6) Machin-ery		(8) Textiles				(12) Manu-factures total
1952	27.6	58.0	11.5			4.7		0.6				13.3
1958	15.7	60.0	16.9			12.0		0.4				23.6
1964	15.1	55.2	17.7			11.3		0.7				28.7

B-series

Calen-der year	(1) Food	(2) Crude mater-ials	(3) oil	(4) Primary goods (1)+(2) +(3)	(5) Process-ed mater-ials	(6) Capital equip-ment	(7) Inter-mediate goods total	(8) Textile pro-ducts	(9) Domes-tic electric equip-ment	(10) Passen-ger cars	(11) Con-sumer manu-factures	(12) Manu-factures total
1964	20.4	35.4	11.8	67.6	19.6	10.6	97.8	0.2	0.0	0.3	1.6	28.7
1973	18.1	28.7	15.7	62.5	22.8	8.3	93.6	1.9	0.1	0.4	5.6	30.6
1974	14.9	20.7	30.4	66.0	22.3	7.0	95.3	1.7	0.2	0.3	4.2	23.7
1984	13.0	12.4	28.8	54.2	30.4	8.3	92.9	1.6	0.1	0.3	4.3	29.8
1985	13.1	12.2	26.7	52.0	31.0	8.9	91.9	1.8	0.1	0.4	4.9	30.9
1986	16.0	12.4	15.4	43.8	31.0	10.5	85.3	2.6	0.2	0.8	7.3	41.8
1987	15.4	13.4	13.8	42.6	31.9	10.9	85.4	3.5	0.3	1.4	10.5	44.1
1988	16.1	13.6	10.1	39.8	32.3	11.9	84.0	3.9	0.6	1.6	12.1	49.0
1989	15.1	13.3	10.2	38.6	31.7	12.6	82.9	4.5	0.7	1.9	13.8	50.3
1990	13.7	11.0	13.4	38.1	30.1	14.0	82.2	4.0	0.5	2.6	14.6	50.3
1991	14.7	10.4	12.8	37.9	30.4	15.0	83.3	4.2	0.6	2.2	13.7	50.9
1992	16.0	10.0	12.9	38.9	28.0	15.3	82.2	5.1	0 7	2.1	14.9	50.2
1993	16.4	10.2	11.6	38.2	27.1	16.1	81.4	5.5	0.8	2.1	15.8	52.0
1994	16.9	9.3	10.1	36.3	25.7	17.8	79.8	5.8	1.0	2.5	17 3	55.2

Source: Ippei Yamazawa and Yuzo Yamamoto, *Foreign Trade and Balance of Payments*, Estimates of Long-term Economic Statistics of Japan since 1968, No.14, Toyo Keizai Shinposha, 1979.
The Summary Report on Trade of Japan, Monthly, Japan Tariff Association.

1994.

(4e) The relative decline of the import share of processed materials since 1989 was replaced by the increase in the import share of capital equipment. Their share of 10.6 percent in 1964 increased to 11.9 percent in 1988 and further to 17.8 percent in 1994. Such upward trend in the imports of capital equipment was enhanced by significant apprecia-

TABLE 3b. IMPORT *Dependence* OF EACH COMMODITY (IMPORTS OF EACH COMMODITY/GNP) (%)

A-series

Calender year	(1) Crude foodstuff	(2) Crude materials	(3) Coal & petroleum			(6) Machinery		(8) Textiles				(12) Manufactures total
1952	3.34	7.02	1.39			0.57		0.15				1 61
1958	1.49	5.70	1.61			1.14		0.04				0.04
1964	1.49	5.46	1.75			1.12		0.07				2.84

B-series

Calender year	(1) Food	(2) Crude materials	(3) oil	(4) Primary goods (1)+(2)+(3)	(5) Processed materials	(6) Capital equipment	(7) Intermediate goods total	(8) Textile products	(9) Domestic electric equipment	(10) Passenger cars	(11) Consumer manufactures	(12) Manufactures total
1964	2.02	3.50	1.17	6.69	1.94	1.05	9.68	0.02	0.00	0.03	0.16	2.84
1973	1.68	2.67	1.46	5.81	2.12	0.77	8.70	0.18	0.01	0.04	0.52	2.85
1974	2.01	2.79	4 10	8.90	3.01	0 95	12.87	0.23	0.03	0.04	0.57	3.20
1984	1.39	1.33	3 08	5.80	3.25	0.89	9.94	0.17	0.01	0.03	0.46	2.65
1985	1.27	1.18	2.59	5.04	3.01	0.86	8.91	0.17	0.01	0.04	0 48	3.00
1986	1.02	0.79	0.99	2.80	1.98	0.67	5.46	0.17	0 01	0.05	0.47	2.68
1987	0.95	0.83	0.86	2.64	1.98	0.68	5.29	0.22	0.02	0 09	0.65	2.73
1988	1.03	0.87	0.65	2.55	2.07	0.76	5 38	0.25	0.04	0.10	0.77	1 96
1989	1.10	0.97	0.74	2.81	2 31	0.92	6.05	0.33	0.05	0.14	1.01	3.67
1990	1.08	0.87	1.06	3 01	2.38	1.11	6.49	0.32	0 04	0.21	1.15	3.97
1991	1.03	0.73	0.90	2.66	2.13	1.05	5.83	0.29	0.04	0.15	0.96	3.56
1992	1 00	0.63	0.81	2.44	1.76	0.96	5.17	0 32	0.04	0.13	0.94	3.16
1993	0.93	0.58	0.66	2.17	1.54	0.92	4.64	0.31	0.05	0.12	0.90	2 96
1994	1.00	0.55	0.60	2.15	1.52	1.05	4.71	0.34	0.06	0.15	1.02	3.26

Source: Ippei Yamazawa and Yuzo Yamamoto, *Foreign Trade and Balance of Payments*, Estimates of Long-term Economic Statistics of Japan since 1968, No.14, Toyo Keizai Shinposha, 1979.
The Summary Report on Trade of Japan, Monthly, Japan Tariff Association.

tion of the yen and by Japanese multinationals' offshore sourcing which became profitable because of the yen appreciation.

In this way, the imports of intermediate goods were diversified and upgraded. The imports of raw materials or primary commodities were of predominant importance in the early 1960s. They were 'non-competing goods' against domestic production, and were imported because of

the quantitative necessity and without caring about prices.

Significance of the imports of crude materials (such as iron-ore and coal) were replaced by processed materials (e.g. pig iron). Such upgrading of the imports of intermediate goods brought about decreases in the total *import dependence* (see Table 3b) of crude and processed materials from 5.44 percent in 1964 to 4.58 percent in 1984 and 2.07 percent in 1994.

The shift to the imports of capital equipment in Period III (1985–1994) resulted in the decrease in the import dependence of the total of crude materials, processed materials and capital equipment from 6.49 percent in 1964 to 5.47 percent in 1984 and to 3.12 percent in 1994.

Thus, when an industry with higher import dependence declined while another industry with lower import dependence expanded, the total import dependence would decrease. In the post-war Japanese economy, as far as intermediate goods imports are concerned, the industrial upgrading has occurred and decreased import dependence as explained above. And this is a result of the technological progress to save imported intermediate goods, or in other words, to increase domestic value added.

(5) The Ministry of International Trade and Industry (MITI) proclaimed that the import *share* of manufactured goods has rapidly increased since 1990, which reached 50.2 percent in 1992 (and 59.1 percent in 1995) (See Table 3a). But this is yet very low compared with 81.6 percent in the United States and with 78.2 percent in Germany, both of which are 1992 figures. Although the import share has increased, the import *dependence* of manufactured goods is still very low; in 1992, the import dependence was 3.2 percent in Japan (Table 3b), while it was 7.3 percent in the US and 17.9 percent in Germany both in 1992.

Moreover, if we confine to manufactured consumer goods (i.e., mainly textile products, domestic electric equipment, passenger cars, etc.), Japan's low level imports were more distinctive: the *share* in total imports was 14.9 percent in 1992 and 17.3 percent in 1994, whereas *import dependence* was merely 0.94 percent and 1.02 percent in 1992 and 1994 respectively.

IV. *Japan's Foreign Trade Policy*

Around 1940, several laws were enacted to set up a war-time regulation system, which came to be called the '1940 regime'[10] or 'Japan Inc.'[11] Among those laws there were the Laws concerning Exports and Imports (1938) and the Food Control Law (February 1942). They established the 'minimum intermediate goods import principle' and continued to be effective after the war through the Foreign Trade and Foreign Exchange Control Law (1949) until its deregulation in 1980. Another characteristic of the war-time control regime is that it is concerned with input-output *quantitative* relations and neglected price considerations as indicated by the above two laws and by also the National Resources Mobilization Law of 1938.

The war-time regulation system aimed at keeping imports as small as possible. Imports were limited to raw materials which Japan could not domestically produce at all or at

[10] Noguchi, Yukio, *1940-nen Taisei* (*The 1940 Regime*) (in Japanese), Toyo-Keizai, Tokyo, 1995. Yamamoto, Shigenobu, *Nihon-gata Seisaku no Gosan* (*Failure of the Japanese-type Economic Policy*) (in Japanese), Dobunkan, Tokyo, 1993.

[11] US Bureau of Commerce, *JAPAN, The Government-Business Relationship*, Washington D. C., April 1972.

reasonable costs. Imports were limited immediately after the war because Japan lacked enough capacity and competitiveness to produce and export goods and services that finance the imports necessary for post-war reconstruction. Actually, a huge import-surplus was incurred. It was the United States aid and Korean War special procurement that enabled Japan to fill the gap in its balance of payments.

In order to limit imports, no imports of manufactured goods were allowed. This resulted in a large price gap between importable goods and non-tradable goods that include manufactured goods except for intermediate goods. Instead, development of a 'full set' of manufacturing industries was promoted. Imports of intermediate goods were planned to be quantitatively at the minimum in order to establish and expand domestic production of needed manufactured goods one by one.[12] All imports were under quantitative restriction and no price consideration in the open market took place.

As a result of the intermediate goods import principle, our trade was mainly a vertical trade in which Japan imported needed primary products which were 'non-competing goods' in exchange for exports of manufactured goods just enough to cover the payment for imports. Only intermediate goods were imported to complement Japan's production (or supply) system so as quantitatively to satisfy technological necessity.

After the war, although the war-time controls should have been liberalized, the 1940 regime actually continued until early 1990's. Same as other industrialized advanced countries, Japan also promoted a modicum of trade liberalization in the 1950's in order to join IMF and World Bank in 1952 and GATT in 1955.

A 'liberalization ratio' was taken as an index. In Japan, liberalization of imports was thought as the abolishment of quantitative restrictions. The liberalization ratio meant then the percentage of items whose quantitative controls were abolished with respect to traded goods in the base year of 1959. Therefore, those items that were not traded in the base year, such as automobile, TV and office machinery were not included in the calculation of the 'liberalization ratio' index.[13]

The oil shocks reminded us of the importance of the availability of natural resources and thus the 'minimum intermediate goods import principle' was all the more strengthened.

V. *Import Behavior of the Japanese Economy*

The important characteristics of post-war Japanese import behavior becomes clear. First, imports consisted mostly of diversified intermediate goods until recently and thus, the 'minimum intermediate goods import principle' was appropriately applicable. Second, technological reasons were mainly responsible for the upgrading of the industrial structure; shifting from labor-intensive light manufactures to capital-intensive heavy and chemical industries represented by steel and basic chemicals, and then to knowledge-intensive machinery in-

[12] To explain this, 'supply-side trade theory' or 'import multiplier' is needed. See, Akamatsu, Kaname, 'The Theory of 'Supply Multiplier' in Reference to the Postwar Economic Situation in Japan,' *The Annals of the Hitotsubashi Academy*, No.2, October 1950. Stolper, Wolfgang, 'Notes on the Dollar Shortage,' *American Economic Review*, 1950.

[13] See, Kojima, Kiyoshi, 'Hidden Trade Barriers in Japan,' *Journal of World Trade Law*, Vol.7 No.2, March/April 1973, pp.138–141.

dustries. This upgrading of the industrial and export structures brought about the lower dependence ratio of intermediate goods imports to GNP for each industry and for the entire national economy.

Now let us examine statistically the characteristics of Japanese imports as much as possible.

Trends of Variables

Period I (1952–1973) and Period III (1985–1994) experienced quite a regular change in the trends of import dependence (M/Y) and relative import prices (P_m/P_d where P_m is an import price index and P_d a domestic price index or GNP deflator with 1985 base). Other notations are; $y=Y/P_d$ which denotes real GNP, $m=M/P_m$ real quantitative imports, and m/y real import dependence. On the other hand, in Period II (1974–1984), many variables changed quite irregularly and were unstable due to the Oil Shocks. Therefore, we excluded this period from our analysis.

In Period I, as shown in Table 1 and Fig.3A, nominal import dependence, M/Y, regularly declined by $-0.17t$ annually. This decrease was made possible by the greater decline in the relative import price, P_m/P_d. As Fig.3C shows, P_m/P_d decreased by $-5.27t$ annually. The decline is due to the worldwide deterioration of the terms of trade that changed unfavorably toward primary products including oil.

A large decline in P_m/P_d induced an increase in the real (quantitative) import dependence, m/y, by $+0.28$ annually (see Fig.3B).

Japanese economy was lucky in Period I (1952–1973), because, although real import dependence increased, the world wide decline in prices of primary commodities enabled Japan to procure imports of intermediate goods needed for rapid industrialization at smaller costs in terms of current prices.

In Period III (1985–1994), Japan was again lucky in industrializing towards high technology industries, which is similar to what happened in Period I. The only difference was the cause of the rapid fall in relative import price, P_m/P_d, which this time was brought about by the appreciation of the yen from 237 yen to the dollar in 1984 to 102 yen to the dollar in 1994.

Import Function

It is expected that, from the above analysis of time-series trend, we are able to obtain an import function for Period I and Period III with good fitting. Table 4 is calculated according to the next estimation equation;

$$\ln m(t)=\text{const.}+\alpha \ln y(t)+\beta \ln \frac{P_m(t)}{P_d(t)}$$

In other words, it is expected that real imports (m) depend upon real income (y) and relative import prices (P_m/P_d); α indicates income elasticity of imports and β price elasticity.

Income elasticity, α, in Period I was 1.14 and increased to 1.82 in Period III, both being statistically significant at 1 percent level. On the other hand, price elasticity was -0.35 in Period I and decreased to -0.08 in Period III, both being statistically insignificant, although negative signs are right. The contribution ratio was such that the changes in real imports (m) were explainable through income effects by 88 percent and through price effects by 12 percent

FIG. 3A. NOMINAL IMPORT DEPENDENCE IN JAPAN 1952–1973

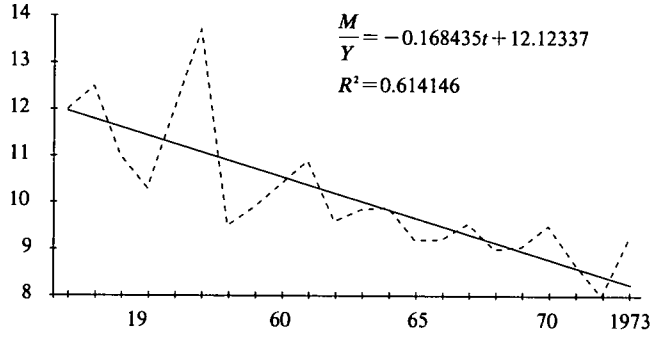


FIG. 3B. REAL IMPORT DEPENDENCE IN JAPAN 1952–1973

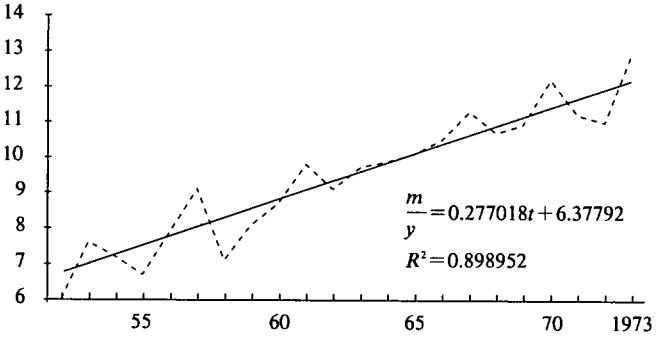
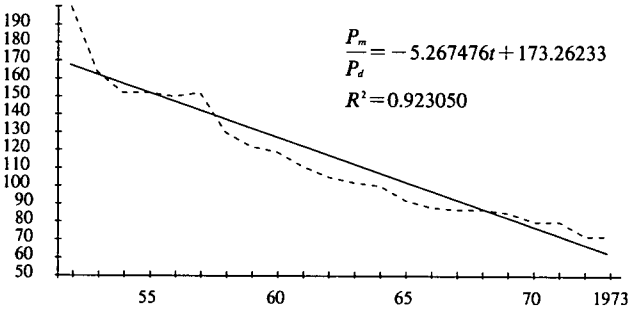


FIG. 3C. RELATIVE IMPORT/DOMESTIC PRICES IN JAPAN 1952–1973



in Period I, while 92 percent and 8 percent respectively in Period III.

The facts that only income elasticity was statistically significant and that income effects were predominant, support our presumption that Japanese imports which consisted mostly of intermediate goods were determined not by price relations but by the technological and quantitative necessity of inputs that complement domestic production system (imports being non-competing group or necessity goods).

The Japanese imports were implements of the national economic production system (let us call it, in brief, 'supply-side implementing imports'). Without those implements, 'processing exports' could neither start nor grow.

The increase of income elasticity from 1.14 in Period I to 1.82 in Period III was distinctive. It is the result of diversification and upgrading of the import structure of intermediate goods; shifting from solely crude materials (natural resources) to processed materials, and further to capital equipment (mostly parts and components of cars and electric equipment).

Since Japanese imports consisted mainly of inputs for the domestic production, imports should vary from one period (year) prior to the changes in production. Actually, in the import function with one year time-lag, income elasticity became larger than that with no time-lag: In 1953–1973, α with no time-lag was 1.299, whereas α with one-year time-lag was 1.378, and in 1985–1993, 1.814 and 2.244 respectively.

Traditional trade theory supposes that tradable goods are all final consumer goods, and

TABLE 4. IMPORT FUNCTION (no time lag)

$\ln m(t) = \text{const.} + \alpha \ln y(t) + \beta \ln P(t)$
m = real import, y = real GNP
$P = P_m/P_d$, P_m = import price index,
P_d = GNP deflator,
base year is 1985

	const	α	β	Adj.R^2	F	$D.W$
(a) Entire Period	$t=1952-1994$					
	−0.2889	+1.1100	−0.2186	0.9916	2473**	0.902**
	(−0.491)	(40.777)**	(−3.307)**			
(b) Period I	$t=1952-1973$					
	−0.0599	+1.1441	−0.3455	0.9924	1372**	2.376**
	(−0.023)	(9.061)**	(−1.308)			
(c) Period II	$t=1974-1984$					
	4.7936	+0.6614	−0.1049	0.6517	10**	1.425**
	(2.720)*	(4.521)**	(−0.710)			
(d) Period III	$t=1985-1994$					
	−9.9820	+1.8157	−0.0832	0.9566	100**	1.159**
	(−3.217)*	(8.429)**	(−0.804)			

Note: T value is shown in brackets.
** Statistically significant at 1% level.
* Statistically significant at 5% level.

amounts of exports and imports are determined by the relative prices (the terms of trade) and social welfare (demand) function. This may be called 'demand-side induced imports'. In this case, imports must follow the change in production after a period (year) interval. Such import function in Japan reduces income elasticity compared to the one with no time-lag to 1.093 in 1953–1973 and 1.219 in 1985–1993.

Thus, it can be said that in Japan 'supply-side implementing imports', rather than 'demand-side induced imports', were predominant until quite recently.

Export Function

Now, let us briefly talk about the export function, though it is not the main topic of this paper. From the point of view of the 'demand-side trade theory', the export function of home-country goods is thought to depend upon demand (or national income) of foreign countries and relative prices between domestic export goods and foreign goods (reflecting international competitiveness).

In contrast, from the point of view of the 'supply-side trade theory', the exports of home country increases as new exportable goods are created, produced with economies of scale, and enhanced price competitiveness. For example, the Japanese export function in 1952–1994 is estimated as follows:

constant	a	b
$\ln x = 6.8191$	$+1.589 \ln y$	$-0.1153 \ln\left(\frac{P_x}{P_d}\right)$
$(-3.661)^{**}$	$(17.647)^{**}$	(-0.713)
Adj $R^2 = 0.9948$	$F = 4014^{**}$	$D.W = 0.620^{*}$

where x stands for real export, y, for real GNP, P_x/P_d, for relative price of exports to GNP deflator, and ** meaning statistically significant at one percent level. T-statistics are shown in brackets.

Here, export/output elasticity (a) is 1.590 for the entire period (1952–1994), which is larger than import/output elasticity of 1.110 (Table 4). The difference between the two elasticities indicates that Japanese trade has a strong export-surplus tendency.

Although foreign demand for Japanese exportables had a big impact, her exports were more directly influenced by the matureness and competitiveness of domestic production capability, which is consistent with the 'supply-side trade theory.' Moreover, the fact that intermediate goods imports were available at cheaper prices, i.e., lower relative prices, P_m/P_d, except in Period II, reduced the cost of exportables and strengthened international competitiveness, and thus created the trend of increasing export surpluses.

VI. *Promoting Horizontal Trade*

Another condemnation against Japanese trade focuses on the small share of horizontal trade (or intra-industry) trade. Since the Grubel=Lloyd index[14] is cumbersome, I prefer to use

[14] Grubel, Herbert and P. J. Lloyd, *Intra-Industry Trade*, London, Macmillan, 1975.

a 'net export index' (*NX*).

NX = (Exports − Imports)/(Exports + Imports). If exports is 0, *NX* is −1. If imports is 0, *NX* is +1. If exports equal imports, *NX* is 0. The greater the imbalance between exports and imports, the closer *NX* is to +1 or −1. There is no desirability for exports being equal to imports, or *NX* = 0. As the net export index for a commodity increases from −1 to +1, the commodity's international competitiveness is strengthened and its production structure shifts first from specialization to imports to both imports and domestic production, and then to specialization to exports. On the other hand, when a commodity already has a comparative advantage from the beginning, the process is reversed. This is a *comparative advantage cycle* for each commodity.

It is said that the Grubel = Lloyd index for Japan in 1991 was so low. The index was 35.1 which was much lower than 66.0 for the United States.[15] Does this mean that Japan is bad? Commodity-wise trade imbalance does not matter. What matters is whether or not both exports and imports are well promoted to the extent that they maximize gains from trade.

Table 5 shows exports, imports and *NX* index (which is not the Grubel = Lloyd index) for seven commodity groups.

(1) Japan specialized completely in importing petroleum and its *NX* index was equal to −1 from 1964 through 1994.

(2) Crude materials (except petroleum) are, similar to petroleum, almost completely specialized in imports. *NX* index ranged between −0.87 in 1964 and −0.82 in 1994.

(3) Food, also similar to petroleum, deepened import-specialization; *NX* index increased from −0.67 in 1964 to −0.93 in 1994.

(4) *NX* index for processed materials (mainly steel and basic chemicals) was between 0.29 in 1964 and −0.04 in 1994, indicating that these products were promoting horizontal (or intra-industry) trade, and that Japan's position changed from having slight comparative advantage in these products to almost equal advantage.

(5) Our comparative advantages in capital equipment were strengthened and *NX* index increased from 0.34 in 1964 to 0.75 in 1984, and to 0.66 in 1994.

(6) Among manufactured consumer goods trade, non-durables (mainly textile products) had a comparative advantage in 1964, and *NX* index for non-durables was +0.84. Non-durables has lost their comparative advantage, and import specialization has been promoted. *NX* index in 1994 was −0.73.

(7) Consumer durable goods (i.e., domestic electric equipment and passenger cars) in Japan, however, had *NX* index of 0.84 in 1964 which increased to 0.89 in 1984 but declined to 0.53 in 1994, and have maintained a strong comparative advantage.

To sum up, Japan had distinctive comparative disadvantages in primary products such as food, petroleum and crude materials, and engaged predominantly in vertical trade during the 1950's. The imports of primary products were paid by the exports of manufactured goods, mainly labor-intensive textiles. In Japan, a large import surplus was feared but actually occurred in the 1950's and the 1960's. Therefore, the 'minimum intermediate goods import principle' was established and its enforcement continued even after the balance of trade turned to surplus around 1969.

[15] See Kimura, F. and Kohama, H., *Empirical Studies in International Economics* (in Japanese), Nippon Hyoron Sha, 1995, p.47.

TABLE 5. EXPORTS, IMPORTS AND NET-EXPORT RATIO

X=exports of i-goods (US$ million)
M=imports of i-goods (US$ million)
(i=1, 2, ...n goods)
NX=net export ratio=$(X-M)/(X+M)$

		X	M	NX
(1) Food				
	1964	318	1,620	−0.67
	1974	848	9,244	−0.83
	1984	1,446	17,783	−0.85
	1994	1,785	46,410	−0.93
(2) Crude Materials (except oil)	1964	191	2,810	−0.87
	1974	1,100	12,828	−0.84
	1984	1,249	16,943	−0.86
	1994	2,466	25,591	−0.82
(3) Oil				
	1964	0	930	−1.00
	1974	0	18,900	−1.00
	1984	0	39,380	−1.00
	1994	0	27,630	−1.00
(4) Processed Materials (Industrial Supplies −Crude Materials −Oil)	1964	2,809	1,562	0.29
	1974	21,893	13,851	0.22
	1984	35,595	41,357	−0.07
	1994	65,762	70,633	−0.04
(5) Capital Equipment (Machinery)	1964	1,718	842	0.34
	1974	19,497	4,362	0.63
	1984	79,570	11,326	0.75
	1994	237,742	48,787	0.66
(6) Consumer Non-durable goods	1964	491	43	0.84
	1974	688	1,389	−0.34
	1984	1,907	3,201	−0.25
	1994	3,196	24,201	−0.73
(7) Consumer Durable goods	1964	1,031	90	0.84
	1974	10,416	1,236	0.79
	1984	48,165	2,731	0.89
	1994	76,312	23,424	0.53

Source: The Summary Report on Trade of Japan, Monthly, Japan Tariff Association.

When imports of intermediate goods were diversified and upgraded from sheer primary products to processed materials and then to capital equipment (parts and components of machinery), horizontal (or intra-industry) trade was promoted extensively with some import surplus, while trade in capital equipment with a large export surplus.

Markets for consumer manufactures were recently opened in 1980 when the Trade and Exchange Control Law was deregulated. Horizontal trade in non-durable consumers (mainly

textile products) generated Japan's import surplus whereas that in durable consumer goods (passenger cars, domestic electric equipment, etc.) generated an export surplus.

Japan has to reduce her huge export surplus (US$120.9 billion or 2.9 percent of Japanese GNP in 1994), although it is said that there has been a sign that the trade gap is closing since 1995.

What Japan should do? Japan should abolish the 'minimum intermediate goods import principle,' and definitely increase imports not only of intermediate goods but also of consumer manufactures up to an optimal scale of foreign trade. The target should be an optimum import dependence of Japanese economy, which is about 20 percent.

There remains a lot of room to increase Japan's import in horizontal trade of manufactured goods, if thousands of regulations, which are not only tariffs, quota and other border impediments but also domestic non-tariff barriers (such as *Keiretsu*), are abolished or reduced, the large price-gap between domestic goods and imported products will be closed, and exports and imports will be equalized.

VII. *Conclusion*

Japanese foreign trade policy is facing a turning point. As many complaints from abroad point out, import dependence of less than 6 percent in 1993 and 1994 symbolized the closedness of the Japanese market. Japan's imports have to increase so as to attain its optimal dependence by abandoning the 'minimum intermediate goods import principle.' Since around 1970, Japanese trade has continued to increase its export surplus, therefore, there has been no reason for insisting on that principle other than to protect bureaucratic privileges. By that time, Japanese government and business have succeeded to grow a full set of manufacturing industries by protecting infant industries. Such export promoting policy was no longer necessary in 1970.

The Japanese liberalization of imports should proceed unilaterally, not to escape from the foreign condemnation but for Japan's own benefit,[16] to lower domestic prices to the level of import prices. At the same time, through deregulation of excessive controls, both imports and exports must be expanded up to their optimal dependence levels at which the maximum gains from trade is realized. Increases in the outflow of foreign direct investment may bring about somewhat increased imports, but it is worried that an excessive outflow may hollow the entire economy and increase unemployment.

Such increase in Japanese imports, as well as foreign direct investment, will create coherent integration and unification in the Asia Pacific economic community.

EMERITUS PROFESSOR OF HITOTSUBASHI UNIVERSITY

[16] I called it a 'fair weather reduction rule'. That is, 'a country should reduce tariffs and NTBs while its balance of payments is favourable, but it should not be allowed to re-raise them even if its balance of payments becomes unfavourable, since at that time some other country will have a favourable balance of payments and will be expected to reduce its own tariffs and NTBs.' Kojima, Kiyoshi, *Japan and a New World Economic Order*, Croom Helm, London, 1977, p.51.